Technology: Competitive & Complementary

DRAM follows fibre optics?

Rumours started by the Financial Times, and not discouraged by Infineon AG's CEO suggest the company is considering spinning off its DRAM business. Memory is around 40% of Infineon's business growing at 3% sequentially and 9% year-over-year in Q1, with $790m in revenues. Siemens AG recently sold off its fiber optics unit to Finisar Corp. for 135m shares of stock, valued at $263m. The suggested DRAM sell would leave the company with more stable business units, such as its auto and industrial group, which reached $450m in Q1 sales and is more inline with Infineon's new CEO, Wolfgang Ziebart.

90nm on strained Si

Intel Malaysia has unveiled three new Pentium M processors, formerly codenamed Dothan, and developed at Intel's Israeli development center in Haifa, as the latest addition to the Centrino. The three new chips – the 755 (2GHz), 745 (1.8GHz) and 735 (1.7GHz) – are the first to be built on a 90-nanometer transistor manufacturing process and manufactured using strained silicon process for production of smaller and faster transistors.

Logic and carbon

Nantero Inc is teaming with LSI Logic Corp to develop semiconductor process technology, expediting the effective use of carbon nanotubes in CMOS fabrication. The JD project will run at LSI Logic's Gresham (Oregon) manufacturing campus, capable of process R&D down to the 65nm node. The high electrical and thermal conductivity, and tensile strength of carbon nanotubes make them highly attractive for electronic device applications.

IBM and Stanford's SpinAps Center

Electron "spin" is aimed at new types of high-performance, low-power electronics. To this end IBM and Stanford University have joined forces to work on "spintronics" and formed the IBM-Stanford Spintronic Science and Spintronics Applications Centre (SpinAps).

"SpinAps researchers will work to create breakthroughs that could revolutionize the electronics industry, just as the transistor did 50 years ago," says Robert Morris, Almaden Lab Director.

SpinAps scientists envision creating new materials and devices with entirely new capabilities – such as reconfigurable logic devices, room-temperature superconductors and quantum computers – that would create dramatically new computational paradigms. Commercial products from SpinAps research however are not expected for at least five years. The first mass-produced spintronic device of 1997 was the giant magnetoresistive head developed at the IBM Almaden lab, a super-sensitive magnetic-field sensor that enabled a 40-fold increase in data density over the past seven years. Another multilayered spintronic structure is key to the high-speed, nonvolatile magnetic random access memory, being developed in an IBM-Infineon collaboration with several other companies.

SpinAps will be directed by IBM Fellow Stuart Parkin and Stanford professors Dr. James S. Harris (Electrical Engineering, Applied Physics and Materials Science) and Dr. Shoucheng Zhang (Physics and Applied Physics) bringing to the Center very different, yet complementary, backgrounds, expertise and perspectives.

Research at the SpinAps Center will involve about a half-dozen Stanford professors, a similar number of IBM scientists, up to 10 graduate students working at both IBM Almaden and Stanford, three or more post-doctoral researchers and two or more visiting faculty. Initial funding for the Center is from IBM and Stanford.

Participating scientists' research projects are also funded by agencies such as the Defense Advanced Research Projects Agency, the U.S. Department of Energy and the National Science Foundation.

Chemical nano partnership

Air Products and Chemicals, Inc. and Nanogate Technologies GmbH, a lead chemical nanotechnology companies in Europe, have agreed the formation of a JV company named Nanogate Advanced Materials GmbH, based in Saarbruecken, Germany. The new company will leverage Nanogate's technology development for the formation and dispersion of nanoparticles.

"Through this joint venture, Air Products gains access to Nanogate's unique capability to produce a variety of inorganic nanoparticles by solution processes and create stable dispersions of nanoparticles," says Lawrence B Thomas, business director, Advanced Materials at AP. " The process of making these dispersions compatible with the systems they are being incorporated into is a critical requirement to gain the maximum benefit from the use of nanoparticles in many applications, including many markets for formulated systems that Air Products currently serves."

"The synergetic effects are obvious. Nanogate offers the unique technology and Air Products the strong existing presence and customer relationships to establish its presence in high-tech markets and products," explains Ralf Michael Zastrau, who with Dr. Ruediger Nass manges the newly founded Nanogate Advanced Materials GmbH. Nanogate Advanced Materials will focus on market opportunities in functional films, coatings and electronic displays.

Quantum key distribution

Results from a new NIST testbed built to demonstrate quantum communications technologies and cryptographic key distribution has been reported.

The testbed provides a measurement and standards infrastructure for research, testing, calibrations and technology development.

Scientists tested the QKD system by generating an encryption key sent between two NIST buildings 730 meters apart.

They are using the testbed to develop data-handling techniques associated with this encryption.

Acadia Optronics LLC of Rockville, MD, consulted on system design and hardware. Partial funding for the project was provided by DARPA.